IN THE CLAIMS:

Please amend the claims as indicated below, without prejudice:

1. (Original) A method of producing hydrogen from oil shale, said method comprising:

(a) transporting oxygen, and a first source of carbon monoxide, into a combustion chamber;

(b) transporting oil shale into the combustion chamber;

(c) combusting the oxygen and the carbon monoxide as part of a combustion cycle to form carbon dioxide therefrom and to heat the oil shale sufficiently to release petroleum hydrocarbons from said oil shale;

(d) placing the combustion chamber into communication with an enclosed gas movement path along which the first source of carbon monoxide is conveyed, such that said enclosed gas movement path, coupled with the use of oxygen, collectively operates to minimize or eliminate aggregation of gases that are nonessential to the combustion cycle; and

(e) transporting carbon monoxide produced in said combustion chamber to a hydrogen producing combustion chamber and combusting said carbon monoxide with oil shale to produce hydrogen.

2. (Original) The method of claim 1, wherein part (e) further comprises supplying oxygen to the hydrogen producing combustion chamber.

3. (Original) The method of claim 1, wherein part (e) further comprises supplying steam to the hydrogen producing combustion chamber.

4. (Original) The method of claim 1, further comprising passing the oil shale countercurrent to the flow of gas in the hydrogen producing combustion chamber.

5. (Original) The method of claim 1, further comprising diverting an effluent gas from the hydrogen producing combustion chamber and passing the gas through a particle separator to remove particles from the gas.

6. (Original) The method of claim 1, further comprising cooling a hydrogen producing combustion chamber effluent gas containing said hydrogen in a boiler.

7. (Original) The method of claim 6, further comprising passing said effluent gas through a catalytic converter to produce carbon dioxide.

8. (Original) The method of claim 7, further comprising cooling said effluent gas in a cooler.

9. (Original) The method of claim 8, further comprising forcing the flow of said effluent gas with at least one blower.

10. (Original) The method of claim 9, further comprising passing said effluent gas through a scrubber to separate the hydrogen from the carbon dioxide.

11. (Original) The method of claim 1, further comprising passing a hydrogen producing combustion chamber effluent gas containing said hydrogen through a scrubber to separate the hydrogen.

12. (Original) The method of claim 11, further comprising supplying a carbon dioxide absorbing solution to the scrubber.

13. (Original) The method of claim 12, further comprising forming said carbon dioxide absorbing solution with sodium carbonate and water.

14. (Original) The method of claim 12, further comprising supplying said carbon dioxide absorbing solution under pressure.

15. (Original) The method of claim 14, further comprising circulating said carbon dioxide absorbing solution through said scrubber.

16. (Original) The method of claim 15, further comprising depressurizing said carbon dioxide absorbing solution to release carbon dioxide from said carbon dioxide absorbing solution.

17. (Original) The method of claim 1, further comprising passing an effluent gas containing said hydrogen through a catalytic converter.

18. (Original) The method of claim 17, further comprising converting carbon monoxide to carbon dioxide in said catalytic converter.

19. (Original) The method of claim 18, further comprising placing steam in said catalytic converter.

20. (Original) The method of claim 1, further comprising diverting an effluent gas from the hydrogen producing combustion chamber and passing the gas through a ferrous deoxidizer.

21. (Original) The method of claim 20, further comprising percolating the gas through multiple fluidized beds of magnetite.

22. (Original) The method of claim 20, further comprising diverting an effluent gas from the ferrous deoxidizer to a heat extracting apparatus.

23. (Original) The method of claim 22, further comprising producing steam in the heat extracting apparatus.

24. (Original) The method of claim 23, further comprising placing the steam in the ferrous deoxidizer.

25. (Original) The method of claim 20, further comprising circulating metallic iron through the ferrous deoxidizer.

26. (Original) The method of claim 20, further comprising reacting iron with steam in the ferrous deoxidizer to produce hydrogen.

27. (Previously presented) A method of regenerating carbon monoxide for producing hydrogen, said method comprising:

(a) combusting oxygen and a first source of carbon monoxide to thereby form a hot carbon dioxide by-product;

(b) conveying the hot carbon dioxide by-product into contact with a carbon source within a combustion chamber, wherein said hot carbon dioxide reacts with said carbon source to regenerate a carbon monoxide by-product;

(c) combusting said carbon monoxide by-product with hydrocarbons, oxygen and steam in a hydrogen producing combustion chamber to produce hydrogen.

28. (Original) The method of claim 27, further comprising cooling said hydrogen in a boiler.

29. (Original) The method of claim 28, further comprising passing said hydrogen through a catalytic converter.

30. (Original) The method of claim 27, further comprising passing said hydrogen through a scrubber.

31. (Original) The method of claim 27, further comprising passing said hydrogen through fluidized beds of magnetite.

32. (Previously presented) A method of producing hydrogen from a carbon source, said method comprising:

(a) producing hydrocarbons and carbon monoxide from said carbon source;

(b) combusting the hydrocarbons and carbon monoxide in a reaction chamber with steam and oxygen to thereby form an effluent containing hydrogen;

(c) separating the hydrogen from the effluent; and

(d) passing the carbon source countercurrent to a flow of gas in the reaction chamber.

33. (Original) The method of claim 32, further comprising passing the effluent containing hydrogen through a catalytic converter.

34. (Original) The method of claim 32, further comprising cooling the effluent containing hydrogen in a boiler.

35. (Original) The method of claim 34, further comprising cooling the effluent containing hydrogen in a cooler.

36. (Original) The method of claim 32, further comprising passing said effluent containing hydrogen through a scrubber.

37. (Original) The method of claim 32, further comprising passing said effluent containing hydrogen through fluidized beds of magnetite.

38. (Original) The method of claim 32, further comprising providing a first zone, a second zone and a third zone in said reaction chamber.

39. (Previously presented) The method of claim 38, further comprising directing said flow of gas in said reaction chamber from said first zone to said second zone to said third zone.

40. (Original) The method of claim 39, further comprising directing movement of the carbon source from the third zone to the second zone to the first zone.

41. (Previously presented) A method of producing hydrogen from a carbon source, said method comprising:

(a) producing hydrocarbons and carbon monoxide from said carbon source;

(b) combusting the hydrocarbons and carbon monoxide in a reaction chamber with steam and oxygen to thereby form an effluent containing hydrogen;

(c) separating the hydrogen from the effluent;

(d) providing a first zone, a second zone and a third zone in said reaction chamber;

(e) directing a flow of gas in said reaction chamber from said first zone to said second zone to said third zone; and

(f) circulating said gas from said third zone to said second zone through a first gas re-circulation line.

42. (Original) The method of claim 41, further comprising diverting hydrocarbon vapors from said first gas re-circulation line for producing hydrocarbon products.

43. (Original) The method of claim 42, further comprising returning unusable hydrocarbons and carbon monoxide to said reaction chamber through a gas return means.

44. (Original) The method of claim 39, further comprising circulating said gas from said second zone to said first zone through a second gas re-circulation line.

45. (Original) The method of claim 39, further comprising directing an effluent of hydrogen and carbon monoxide out of said reaction chamber at a location between said second zone and said third zone.

46. (Original) The method of claim 45, further comprising adding steam to said effluent of hydrogen and carbon monoxide.

47. (Original) The method of claim 32, further comprising preheating said oxygen before combustion in an oxygen pre-heater.

48. (Original) The method of claim 32, further comprising preheating said steam in a steam pre-heater before combustion.

49. (Canceled)

50. (Original) The method of claim 32, further comprising passing said effluent through a particle separator to remove particles from the effluent.

51. (Original) The method of claim 32, further comprising forcing the flow of said effluent gas with at least one blower.

52. (Original) The method of claim 36, further comprising supplying a carbon dioxide absorbing solution to the scrubber.

53. (Original) The method of claim 52, further comprising circulating said carbon dioxide absorbing solution through said scrubber.

54. (Original) The method of claim 33, further comprising converting carbon monoxide to carbon dioxide in said catalytic converter.

55. (Original) The method of claim 32, further comprising percolating the gas through multiple fluidized beds of magnetite in a ferrous deoxidizer.

56. (Original) The method of claim 55, further comprising diverting an effluent gas from the ferrous deoxidizer to a heat extracting apparatus.

57. (Original) The method of claim 56, further comprising producing steam in the heat extracting apparatus.

58. (Original) The method of claim 57, further comprising placing the steam produced in the heat extracting apparatus into the ferrous deoxidizer.

59. (Original) The method of claim 58, further comprising circulating metallic iron through the ferrous deoxidizer.

60. (Original) The method of claim 59, further comprising reacting iron with steam in the ferrous deoxidizer to produce hydrogen.

61. (Original) A method of producing hydrogen from a carbon source, said method comprising:

(a) providing a combustion chamber having a first zone, a second zone, and a third zone;

(b) combusting carbon monoxide, oxygen and steam in the first zone of the combustion chamber;

(c) directing a flow of gas from the first zone to the second zone to the third zone;

(d) placing said carbon source in the third zone of the combustion chamber and directing movement of the carbon source from the third zone to the second zone to the first zone;

(e) directing an effluent of hydrogen and carbon monoxide from said combustion chamber;

(f) separating the hydrogen from the carbon monoxide.

62. (Original) The method of claim 61, further comprising circulating said gas from said third zone to said second zone through a first gas re-circulation line.

63. (Original) The method of claim 62, further comprising diverting hydrocarbon vapors from said first gas re-circulation line for producing hydrocarbon products.

64. (Original) The method of claim 63, further comprising returning unusable hydrocarbons and carbon monoxide to said combustion chamber through a gas return means.

65. (Original) The method of claim 62, further comprising circulating said gas from said second zone to said first zone through a second gas re-circulation line.

66. (Original) The method of claim 61, further comprising directing said effluent of hydrogen and carbon monoxide out of said combustion chamber at a location between said second zone and said third zone.

67. (Original) The method of claim 61, further comprising preheating said oxygen in an oxygen pre-heater before combustion.

68. (Original) The method of claim 61, further comprising preheating said steam in a steam pre-heater before combustion.

69. (Original) The method of claim 61, further comprising controlling the temperature in the first zone to range between approximately 1100 degrees F to approximately 1800 degrees F.

70. (Original) The method of claim 69, further comprising controlling the temperature in the second zone to range between approximately 800 degrees F to approximately 1100 degrees F.

71. (Original) The method of claim 70, further comprising controlling the temperature in the third zone to range between approximately 300 degrees F to approximately 800 degrees F.

72. (Original) The method of claim 61, further comprising directing said effluent of hydrogen and carbon monoxide out of said combustion chamber at a temperature range of between approximately 900 degrees F and 950 degrees F.

73. (Previously presented) A method of producing hydrogen from a carbon source, said method comprising:

(a) providing a combustion chamber having a first zone, a second zone, and a third zone, wherein a temperature of said combustion chamber decreases from said first zone to said second zone to said third zone;

(b) combusting carbon monoxide, oxygen and steam in the first zone of the combustion chamber;

(c) placing said carbon source in the third zone of the combustion chamber and directing movement of the carbon source from the third zone to the second zone to the first zone;

(e) directing an effluent of hydrogen and carbon monoxide out of said combustion chamber at a location between said second zone and said third zone.

74. (Original) The method of claim 73, further comprising (f) separating the hydrogen from the carbon monoxide.

75. (Original) A method of producing hydrogen from a carbon source, said method comprising:

(a) providing a combustion chamber having a first zone, a second zone, and a third zone;

(b) combusting carbon monoxide, oxygen and steam in the first zone of the combustion chamber;

(c) placing said carbon source in the third zone of the combustion chamber;

(d) providing temperatures in said first zone ranging between approximately 1100 degrees F to approximately 1800 degrees F;

(e) providing temperatures in said second zone ranging between approximately 800 degrees F to approximately 1100 degrees F;

(f) providing temperatures in said third zone ranging between approximately 300 degrees F to approximately 800 degrees F; and

(g) directing an effluent of hydrogen and carbon monoxide from said combustion chamber.

76. (Original) The method of claim 75, further comprising (h) separating the hydrogen from the carbon monoxide.

77. (Original) The method of claim 76, further comprising providing a temperature of said effluent of hydrogen and carbon monoxide at a range of between approximately 900 degrees F to approximately 950 degrees F.

78. (Original) A method of producing hydrogen from a carbon source, said method comprising:

(a) providing a combustion chamber having a first zone, a second zone, and a third zone;

(b) combusting carbon monoxide, oxygen and steam in the first zone of the combustion chamber;

(c) placing said carbon source in the third zone of the combustion chamber;

(d) recirculating a flow of gas from the third zone to the second zone through a first gas re-circulation line;

(e) recirculating a flow of gas from the second zone to the first zone through a second gas re-circulation line; and

(f) directing an effluent of hydrogen and carbon monoxide from said combustion chamber.

79. (Original) The method of claim 78, further comprising (g) separating the hydrogen from the carbon monoxide.

80. (Original) The method of claim 78, further comprising diverting hydrocarbon vapors from said first gas re-circulation line for producing hydrocarbon products.

81. (Original) The method of claim 80, further comprising returning unusable hydrocarbons and carbon monoxide to said combustion chamber through a gas return means.

82. (Original) The method of claim 80, further comprising directing an effluent of hydrogen and carbon monoxide out of said combustion chamber at a location between said second zone and said third zone.

83. (Previously presented) A method of producing hydrogen from a carbon source, said method comprising:

(a) producing hydrocarbons and carbon monoxide from said carbon source;

(b) combusting the hydrocarbons and carbon monoxide in a reaction chamber with steam and oxygen to thereby form an effluent of hydrogen and carbon monoxide;

(c) passing the effluent of hydrogen and carbon monoxide through a catalytic converter, without cooling said effluent prior to passing said effluent through said catalytic converter, to convert the carbon monoxide to carbon dioxide; and

(d) separating the carbon dioxide from the hydrogen.

84. (Original) The method of claim 83, further comprising cooling the hydrogen and carbon monoxide in a boiler.

85. (Original) The method of claim 84, further comprising cooling the hydrogen and carbon monoxide in a cooler.

86. (Original) The method of claim 85, further comprising passing said carbon dioxide and said hydrogen through a scrubber.

87. (Currently amended) A method of producing hydrogen from a carbon source, said method comprising:

(a) placing said carbon source in a combustion chamber;

(b) combusting carbon monoxide, oxygen, and steam in the combustion chamber with the carbon source to produce an effluent of hydrogen and carbon monoxide;

(c) percolating the effluent of hydrogen and carbon monoxide through fluidized beds of magnetite and reacting iron with steam in a ferrous deoxidizer to produce hydrogen.

88. (Original) The method of claim 87, further comprising diverting an effluent gas from the ferrous deoxidizer to a heat extracting apparatus.

89. (Original) The method of claim 88, further comprising producing steam in the heat extracting apparatus.

90. (Original) The method of claim 89, further comprising placing the steam produced in the heat extracting apparatus into the ferrous deoxidizer.

91. (Original) The method of claim 90, further comprising circulating metallic iron through the ferrous deoxidizer.

92. (Canceled)

93. (Original) A method of producing hydrogen from oil shale, said method comprising:

(a) producing hydrocarbons and carbon monoxide from said oil shale;

(b) combusting the hydrocarbons and carbon monoxide in a reaction chamber with steam and oxygen to thereby form an effluent containing hydrogen and carbon monoxide; and

(c) separating the hydrogen from the effluent;

wherein the method further comprises providing a first zone, a second zone and a third zone in said reaction chamber;

wherein the method further comprises directing a flow of gas in said reaction chamber from said first zone to said second zone to said third zone;

wherein the method further comprises directing movement of the oil shale from the third zone to the second zone to the first zone;

wherein the method further comprises circulating said gas from said third zone to said second zone through a first gas re-circulation line;

wherein the method further comprises diverting hydrocarbon vapors from said first gas re-circulation line for producing hydrocarbon products;

wherein the method further comprises returning unusable hydrocarbons and carbon monoxide to said reaction chamber through a gas return means;

wherein the method further comprises circulating said gas from said second zone to said first zone through a second gas re-circulation line;

wherein the method further comprises directing said effluent of hydrogen and carbon monoxide out of said reaction chamber at a location between said second zone and said third zone;

wherein the method further comprises preheating said oxygen in an oxygen pre-heater before combustion;

wherein the method further comprises preheating said steam in a steam pre-heater before combustion;

wherein the method further comprises passing the oil shale countercurrent to a flow of gas in the reaction chamber;

wherein the method further comprises passing said effluent through a particle separator to remove particles from the effluent;

wherein the method further comprises forcing the flow of said effluent gas with at least one blower;

wherein the method further comprises controlling the temperature in the first zone to range between approximately 1100 degrees F to approximately 1800 degrees F;

wherein the method further comprises controlling the temperature in the second zone to range between approximately 800 degrees F to approximately 1100 degrees F;

wherein the method further comprises controlling the temperature in the third zone to range between approximately 300 degrees F to approximately 800 degrees F;

wherein the method further comprises directing said effluent of hydrogen and carbon monoxide out of said reaction chamber at a temperature range of between approximately 900 degrees F and 950 degrees F.

94. (Previously presented) A method of producing hydrogen from a carbon source, said method comprising:

(a) producing hydrocarbons and carbon monoxide from said carbon source;

(b) combusting the hydrocarbons and carbon monoxide in a reaction chamber with steam and oxygen to thereby form an effluent containing hydrogen;

(c) separating the hydrogen from the effluent; and

(d) recirculating the flow of gas in said reaction chamber along a re-circulation path that is external to the reaction chamber and that does not encounter a cooling device.

95. (Currently amended) A method of producing hydrogen from a carbon source, said method comprising:

(a) producing hydrocarbons and carbon monoxide from said carbon source;

(b) combusting the hydrocarbons and carbon monoxide in a reaction chamber with steam and oxygen to thereby form ~~an~~ a first effluent containing hydrogen;

(c) separating the hydrogen from the first effluent; and

(d) withdrawing a second gas effluent from said reaction chamber for recirculating into said reaction chamber.